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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10-051,375 | 01/17/2002 | Tae Bong hom | PAS202A | 9703 |

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EXAMINER

LYONS, MICHAEL A

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

2877

DATE MAILED: 06/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/051,375

Applicant(s)

EOM ET AL

Examiner

Michael A. Lyons

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may be subject to earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on 17 January 2002 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of.
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application):
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other

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DETAILED ACTION

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "400" and "10" have both been used to designate phase angle calculating electronics. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Figures 1, 2, and 3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

The abstract of the disclosure is objected to because it exceeds the 15-line and 150-word maximum length standard. Correction is required. See MPEP § 608.01(b).

Claim Objections

Claim 8 is objected to because of the following informalities: the word "conducts" after the offset and phase adjustment means should read "conduct". Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over the prior art in view of Yamashita et al (6,172,560) and in further view of Kato (6,294,952).

Regarding claims 1-4, the combination of the prior art and Yamashita, as discussed below, discloses all of the claimed elements of the invention and therefore the claimed method of the invention can be applied to the combined device in order to facilitate the desired results of the invention.

However, neither the prior art nor Yamashita discloses the use of an ellipse and ellipse parameters to aid in the calculation of the necessary phase angles and the according linearity correction. Kato, in claim 37, discloses the use of an ellipse that is used to obtain a DC offset error, a phase error, and an amplitude error. It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the ellipse technique of Kato to the combination of the prior art and Yamashita to aid in the necessary calculations, as the ellipse parameters are well known mathematical statements.

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With specific regard to claim 2, the use of a lookup table to aid in calculations over the use of a device is well known, and it would have been obvious to one of ordinary skill in the art at the time the invention was made to use such a table to aid in calculation.

Claims 5-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over the prior art in view of Yamashita et al (6,172,560).

Regarding claim 5, the prior art (Fig. 1) discloses a two-frequency laser interferometer (entire figure), 90-degree phase mixing electronics in the form of a 90-degree phase shifter 7, and phase angle calculating electronics 400. The prior art, however, fails to disclose a nonlinearity error correcting electronics.

Yamashita (Fig. 1) teaches the use of a circuit that rejects and compensates for non-linear distortions in the system. It would have been obvious to one of ordinary skill in the art at the time the invention was made to add the circuit of Yamashita to the prior art device in order to correct the admitted linearity issues that arise during the displacement detection and measurement of the prior art device.

As for claim 6, the prior art discloses a laser 1, a first beam splitter 2, a photodetector 6a in the reference path, a polarizing beam splitter 3, and a photodetector 6b in the measuring path.

As for claim 7, the prior art discloses a 90-degree phase shifter 7, a first mixer 8a, a second mixer 8b, and a pair of low pass filters 9a and 9b.

As for claim 8, Hamashita discloses offset adjustment circuits 44 and 46, while Fig. 4 is a depiction of phase and amplitude adjustment means. The use of a microprocessor to obtain and calculate ellipse parameters is well known in the art.

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As for claim 9, giving a series of elements a free order of arrangement is a matter of design choice and therefore is well known.

Conclusion

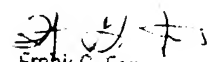
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, a heterodyne interferometer arrangement to Wilkening et al (5,331,400).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael A. Lyons whose telephone number is 703-305-1933. The examiner can normally be reached on Monday thru Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G Font can be reached on 703-308-4877. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-0725 for regular communications and 703-308-0725 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0935.

MAL
May 27, 2003


Frank G. Font
Supervisory Patent Examiner
Technology Center 2800